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LEE & HAYES PLLC
421 W RIVERSIDE AVENUE SUITE 500
SPOKANE, WA 99201

EXAMINER

ZHONG, JUN FEI

ART UNIT	PAPER NUMBER
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2623

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/684,138

Applicant(s)

BARRETT ET AL.

Examiner

Jun Fei Zhong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-55 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-55 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 06/05/2007, 03/09/2007, 11/27/2006, 05/04/2006, 02/28/2005, and 02/05/2004. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Regarding claims 20, 30 and 32-33, the phrase "likely or possible", "proximate" renders the claims indefinite because the claims include elements not actually disclosed (those encompassed by "likely or possible", "proximate"), thereby rendering the scope of the claims unascertainable. See MPEP § 2173.05(d).

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422

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F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claims 1-55 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-73 of copending Application No. 10/278674. Although the conflicting claims are not identical, they are not patentably distinct from each other for the reason below.

Claim 1 of application 10/684138	Claim 55 of application 10/218674
A method for fast channel changing in a multicast video distribution architecture, the method comprising:	A method for a headend of a television-based entertainment network, the method comprising actions of:
detecting a channel change request that indicates a requested channel, the requested channel corresponding to a multicast group;	receiving a channel change request from a client device, the channel change request indicating a request to change channels to the particular channel;
transmitting a retained intra frame for the requested channel as a unicast communication.	sending the most-recently-received intra frame of broadcast video data and the one or more non-intra frames of broadcast video data to the client device responsive

	<p>to the action of receiving the channel change request, further comprising sending at least the one or more non-intra frames of broadcast video data to the client device at a transmission rate that exceeds a real-time transmission rate of the broadcast video data</p>
	<p>continuously receiving a stream of broadcast video data for a particular channel;</p> <p>storing the stream of broadcast video data for the particular channel in a storage device, the stream of broadcast video data including a plurality of intra frames of broadcast video data and a plurality of non-intra frames of broadcast video data; wherein the plurality of intra frames of broadcast video data include a most-recently-received intra frame of broadcast video data, and the plurality of non-intra frames of broadcast video data include a non-intra frame of broadcast</p>

	<p>video data that corresponds to a current broadcast time;</p> <p>retrieving the most-recently-received intra frame of broadcast video data and one or more non-intra frames of the plurality of non-intra frames of broadcast video data from the storage device, the one or more non-intra frames of broadcast video data being temporally located after the most-recently-received intra frame of broadcast video data and before the non-intra frame of broadcast video data that corresponds to the current broadcast time;</p>
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Claims 13 and 23 of application 10/684138	Claim 13 of application 10/218674
A channel change server comprising:	A system for accelerating channel changing in a video broadcast environment, the system comprising:
cached ("retained" instead of "cached" for claim 23) intra frames for a plurality of video streams, each respective video stream of the plurality of video streams	a storage device that retains broadcast video data for a plurality of channels;

associated with a respective channel of a plurality of channels;	
a channel change request detector that is capable of detecting channel change requests from individual clients of a plurality of clients;	a channel change request handler that receives channel change requests from a plurality of client devices, the channel change requests including requested channels;
a channel change request handler that is configured to respond to a detected channel change request from a particular client of the plurality of clients by extracting a most recent intra frame of a video stream associated with a requested channel from the cached intra frames and by transmitting the extracted most recent intra frame to the particular client using a unicast communication;	a video data extractor that receives the requested channels from the channel change request handler, the video data extractor adapted to access the retained broadcast video data and to retrieve intra frames of broadcast video data that are prior to a current broadcast time for the requested channels;
wherein the channel change server is associated with multicast video distribution of the plurality of video streams.	a video data booster that is adapted to access the retained broadcast video data and to retrieve respective streams of broadcast video data that follow respective ones of the retrieved intra frames of

	<p>broadcast video data and that are of sufficient size to fill decoding buffers of the plurality of client devices; and</p> <p>a video data distributor that receives the retrieved intra frames of broadcast video data and the retrieved respective streams of broadcast video data that follow therefrom, the video data distributor adapted to transmit the retrieved intra frames of broadcast video data and the retrieved respective streams of broadcast video data that follow therefrom to the plurality of client devices responsive to the channel change requests, the video data distributor further adapted to transmit the retrieved respective streams of broadcast video data at a transmission rate that exceeds a real-time transmission rate of the broadcast video data</p>
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Claim 35 of application 10/684138	Claims 20 and 21 of application 10/218674
An arrangement for channel changing,	(claim 20) An arrangement for accelerating

comprising:	channel changing, the arrangement comprising:
retention means for retaining at least one intra frame for each video stream of a plurality of video streams, each respective video stream associated with a respective channel of a plurality of channels;	(claim 20) storage means for storing broadcast video data over time;
detection means for detecting a channel change request from a client that indicates a requested channel, the channel change request from the client signifying a demand to switch from a first multicast group to a second multicast group that corresponds to the requested channel; and	(claim 21) handling means for handling-a the channel change request from the client device, the channel change request having a requested channel; the handling means configured to receive the channel change request from the client device, the handling means further configured to provide at least the requested channel to at least the extraction means
handler means for handling the channel change request by transmitting a retained intra frame to the client via a unicast communication, the retained intra frame retained by the retention means from a respective video stream that is associated	(claim 21) handling means for handling-a the channel change request from the client device, the channel change request having a requested channel; the handling means configured to receive the channel change request from the client device, the

<p>with the requested channel.</p>	<p>handling means further configured to provide at least the requested channel to at least the extraction means</p> <p>(claim 20) extraction means for extracting broadcast video data from the storage means, the extraction means configured to seek backward in time over the broadcast video data until an intra frame of the broadcast video data is located, the extraction means further configured to retrieve the intra frame;</p>
	<p>(claim 20) boosting means for boosting broadcast video data retrieval from the storage means, the boosting means configured to retrieve a stream of the broadcast video data that follows the intra frame, the stream being of a size that is sufficient to fill a decoding buffer of a client device; and</p> <p>distribution means for distributing the intra frame and the stream of the broadcast</p>

	video data to the client device,, the distribution means configured to distribute the stream of the broadcast video data to the client device at a transmission rate that exceeds a real-time transmission rate of the broadcast video data responsive to a channel change request
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Claim 41 of application 10/684138	Claim 7 of application 10/218674
A server that is configured to retain at least one independent frame for each video channel of a plurality of video channels that are being distributed using multicast communications and that is adapted to respond to channel change requests from clients by transmitting the retained at least one independent frame of a requested video channel to a requesting client using a unicast communication.	A system for accelerating channel changing in a video broadcast environment, the system comprising: a storage device that retains broadcast video data for a plurality of channels; a video data extractor that accesses the retained broadcast video data and retrieves an intra frame of broadcast video data that is in the past for a requested channel of the plurality of channels; a video data booster that accesses

	<p>the retained broadcast video data and retrieves a broadcast video data stream that follows the retrieved intra frame of broadcast video data: and</p> <p>a video data distributor that receives the retrieved intra frame of broadcast video data and transmits the retrieved intra frame of broadcast video data and (ii) receives the retrieved broadcast video data stream and transmits the retrieved broadcast video data stream at a transmission rate that exceeds a real-time transmission rate of the broadcast video data responsive to a channel change request</p>
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Claim 48 of application 10/684138	Claim 27 of application 10/218674
A system comprising:	A system for accelerating channel changing in a video broadcast environment, the system comprising:
at least one processor;	one or more processors,
one or more media including processor-	one or more memories, the one or

<p>executable instructions that are capable of being executed by the at least one processor, the processor-executable instructions adapted to direct the system to perform actions comprising:</p>	<p>more memories including broadcast video data and electronically-executable instructions;</p> <p>the one or more processors capable of executing the electronically-executable instructions to perform actions comprising:</p>
<p>multicasting a plurality of channels;</p> <p>retaining at least one intra frame for each channel of the plurality of channels;</p> <p>transmitting a retained intra frame for a requested channel as a unicast communication responsive to a channel change request.</p>	<p>receive a request for a new channel from a client device;</p> <p>access the broadcast video data for the new channel;</p> <p>seek backward in time along the broadcast video data for the new channel until an intra frame is located;</p> <p>retrieve the intra frame for the new channel from the broadcast video data;</p> <p>retrieve a stream of broadcast video data that starts after the intra frame and extends along the broadcast video data for the new channel;</p> <p>transmit the intra frame for the new channel to the client device;</p> <p>transmit the stream of broadcast</p>

	video data for the new channel to the client device at a transmission rate that exceeds a real-time transmission rate of the broadcast video data responsive to the request for the new channel
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Note the comparison above, claim 1 of the instant application is not patentably distinct from claim 55 in application 10/218,674. Since claim 1 in the instant application is broader than claim 55 in application 10/218,674, an allowance of claim 1 would result in the unwarranted time use extension of the monopoly that would be granted for the invention as defined in claim 55 in application 10/218,674 if issued.

Claims 2-55 in the instant application corresponds to claims 1-73 in application 10/218,674 respectively.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

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applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-7, 9-10, 12-15, 17-20, 23-25, 27-32, 35-45, 47-55 are rejected under 35 U.S.C. 102(e) as being anticipated by Mao (Patent # US 6,728,965 B1).

As to claim 23, Mao discloses a channel change server (e.g., broadband digital terminal (BDT) 12) comprising:

retained intra frames for a plurality of video streams (e.g., FIFO buffer 50 stores I frame; Fig. 7), each respective video stream of the plurality of video streams associated with a respective channel of a plurality of channels (see col. 8, lines 14-36);

a channel change request detector that is capable of detecting channel change requests from individual clients of a plurality of clients (e.g., broadband digital terminal (BDT) 12 receives channel change request from user) (see col. 5, lines 51-65);

a channel change request handler (e.g., broadband digital terminal (BDT) 12) that is configured to respond to a detected channel change request from a particular client of the plurality of clients by extracting a most recent intra frame of a video stream associated with a requested channel from the cached intra frames and by transmitting the extracted most recent intra frame to the particular client using a unicast communication (see col. 6, lines 16-29; col. 8, lines 36-58);

wherein the channel change server is associated with multicast video distribution of the plurality of video streams (see col. 8, lines 59-64).

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As to claim 13, this claim contains the limitation "cached" instead of "retained" in claim 23. Thus, claim 13 is analyzed as previously discussed with respect to claim 23 above.

As to claims 1, 35, and 41, they contain the limitations of claim 23 and are analyzed as previously discussed with respect to claim 23 above.

As to claim 48, Mao discloses a system comprising:
at least one processor (e.g., processor 55; Fig. 7);
one or more media (e.g., buffer memory 50 or 57) including processor-executable instructions that are capable of being executed by the at least one processor (e.g., BDT 12 can be equipped with element management system 13 which is software based) (see col. 3, lines 34-41), the processor-executable instructions adapted to direct the system to perform actions comprising:

multicasting a plurality of channels (see col. 8, lines 59-64);
retaining at least one intra frame for each channel of the plurality of channels (see col. 8, lines 14-36);

transmitting a retained intra frame for a requested channel as a unicast communication responsive to a channel change request (see col. 6, lines 16-29; col. 8, lines 36-58).

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As to claim 24, Mao discloses the channel change server as recited in claim 23, further comprising:

a video stream buffer (e.g., FIFO buffer 50 stores video stream from multiple channels; Fig. 5 and 7) that is adapted to buffer each video stream of the plurality of video streams to create a plurality of respective buffered portions (see col. 8, lines 14-36 and 59-64).

As to claim 25, Mao discloses the channel change server as recited in claim 23, further comprising:

a join command issuer (e.g., BDT 12) that is adapted to send a join message (e.g., confirmation signal) to a replication point (e.g., broadband network unit (BNU) 14; Fig. 1) to cause the replication point to join the particular client to a multicast group corresponding to the requested channel (see col. 6, lines 16-29).

As to claim 27, Mao discloses the channel change server as recited in claim 23, further comprising:

a synchronization determiner (e.g., processor 55) that is adapted to synchronize a multicast joining operation for the particular client to a multicast group corresponding to the requested channel with regard to a next decodable frame (e.g., I frame) of the video stream associated with the requested channel (see col. 8, lines 42-51; Fig. 5 and 7).

As to claim 28, Mao discloses the channel change server as recited in claim 27, wherein the synchronization determiner (e.g., processor 55) is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel using a quasi-predicted time (e.g., instantly) of the next decodable frame of the video stream associated with the requested channel (see col. 8, lines 42-51; Fig. 5 and 7).

As to claim 29, Mao discloses the channel change server as recited in claim 27, further Comprising:

a time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) of the video stream that is associated with the requested channel (see col. 8, lines 37-42);

wherein the synchronization determiner (e.g., processor 55) is further adapted to synchronize the multicast joining operation for the particular client to the multicast group corresponding to the requested channel with regard to the time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel; Fig. 5) of the video stream that is associated with the requested channel (e.g., processor 55 is always pointing to I frames store in FIFO buffer 50, when a channel change request received, it can instantly transmit I frame to user) (see col. 8, lines 36-51).

As to claim 30, Mao discloses the channel change server as recited in claim 29, wherein a size of the time-delayed buffered portion (e.g., FIFO buffer 50 stores

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minimum 15 frames for each channel; one group of picture (15 frames) in MPEG-2 standard is about half second) corresponds to a likely or possible time period (e.g., half second or more) consumed when joining the particular client to the multicast group corresponding to the requested channel (see col. 8, lines 4-13 and 36-42).

As to claim 31, Mao discloses the channel change server as recited in claim 29, wherein a size of the time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) corresponds to a combination of a multicast joining time (i.e., transmitting time) and an intra frame interval duration (e.g., one group of picture (15 frames) in MPEG-2 standard is about half second) (see col. 7, lines 39-57; col. 8, lines 36-51; Fig. 5 and 6).

As to claim 32, Mao discloses the channel change server as recited in claim 29, wherein a joining time (i.e., transmitting time) of the time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) corresponds to a likely or possible time period consumed when joining the particular client to the multicast group corresponding to the requested channel (see col. 7, lines 39-57; col. 8, lines 36-51; Fig. 5 and 6).

As to claims 14-15, and 17-20, they contain the limitations of claims 24-25, 27-30 and are analyzed as previously discussed with respect to claims 24-25 and 27-30 above.

As to claim 36, Mao discloses the arrangement as recited in claim 35, further comprising:

buffer means (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) for buffering each respective video stream of the plurality of video streams to establish a respective buffered portion for each respective video stream;

synchronization means (e.g., processor 55) for synchronizing a joining of the client to the second multicast group (i) with reference to a respective buffered portion (e.g., minimum 15 frames stored for each channel) for the respective video stream that is associated with the requested channel and (ii) with regard to a next decodable frame of the respective video stream that is associated with the requested channel (e.g., I frame location) (see col. 8, lines 36-51; Fig. 5).

As to claim 37, Mao discloses the arrangement as recited in claim 36, further comprising:

issuance means (e.g., BDT 12) for issuing a join command (e.g., confirmation signal) responsive to the synchronization means (see col. 6, lines 16-29).

As to claim 38, Mao discloses the arrangement as recited in claim 35, wherein the retention means (e.g., buffer 50) comprises at least one of (i) buffering means for buffering the at least one intra frame for each video stream of the plurality of video streams and (ii) caching means for caching at least one intra frame for each video

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stream of the plurality of video streams (e.g., FIFO buffer 50 stores video data for each channel) (see col. 8, lines 14-36; Fig. 5).

As to claim 39, Mao discloses the arrangement as recited in claim 35, wherein the arrangement comprises at least one server (e.g., EMS 13 is located at service provider facility and function as a server) (see col. 3, lines 34-41; Fig. 1).

As to claim 40, Mao discloses the arrangement as recited in claim 35, wherein the arrangement comprises one or more processor-accessible media (e.g., buffer 50 stores more than one video frame for each channel) (see col. 8, lines 36-42).

As to claim 42, Mao discloses the server as recited in claim 41, wherein the server is capable of multicasting the plurality of video channels to the clients (e.g., BDT 12 can connect numbers of BNU 14) (see col. 4, lines 22-26; Fig. 1).

As to claim 43, Mao discloses the server as recited in claim 41, wherein the server is capable of synchronizing a multicast joining operation for the requesting client with regard to a next decodable frame of the requested video channel (see col. 8, lines 52-64).

As to claim 44, Mao discloses the server as recited in claim 43, wherein the next decodable frame of the requested video channel comprises a next independent frame (e.g., I frame is independent frame) (see col. 8, lines 52-64).

As to claim 45, Mao discloses the server as recited in claim 43, wherein the next decodable frame of the requested video channel comprises a next dependent frame (e.g., buffer 50 stores P and B frames, which are dependent frames) (see col. 8, lines 36-39).

As to claim 47, Mao discloses the server as recited in claim 41, wherein the server is further adapted to issue a join command (e.g., confirmation signal) irrespective of a complete or an incomplete delivery to the requesting client of the retained at least one independent frame of the requested video channel (see col. 6, lines 16-29).

As to claim 49, Mao discloses the system as recited in claim 48, wherein the system comprises a video provider (e.g., video data transmit to BDT 12 over ATM network) and a channel change server (e.g., BDT 12) (see col. 3, lines 42-46).

As to claim 50, Mao discloses the system as recited in claim 48, wherein the system comprises a video provider and a channel change server that are co-located (see col. 3, line 66 through col. 4, line 6).

As to claim 51, Mao discloses the system as recited in claim 48, wherein the system comprises a channel change server (e.g., BDT 12) that receives the plurality of channels from a video provider; and wherein the channel change server performs the action of multicasting the plurality of channels (e.g., BDT 12 can connect numbers of BNU 14) (see col. 7, lines 62-65; col. 4, lines 22-26; Fig. 1).

As to claim 52, Mao discloses the system as recited in claim 48, wherein the processor-executable instructions (e.g., element management system 13 which is software based) are adapted to cause the system to perform a further action comprising:

synchronizing a multicast joining operation to a multicast group corresponding to the requested channel with regard to a next decodable frame of the requested channel (e.g.,) (see col. 6, lines 16-30; col. 8, lines 14-26).

As to claim 53, Mao discloses the system as recited in claim 52, wherein the processor-executable instructions (e.g., element management system 13 which is software based) are adapted to cause the system to perform a further action comprising:

buffering (e.g., buffer 50 stores video frame for each channel) a video stream portion of a video stream that is associated with the requested channel (see col. 8, lines 36-42);

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wherein the action of synchronizing comprises an action of determining when the next decodable frame is present within the buffered video stream portion of the video stream that is associated with the requested channel (e.g., processor 55 always pointing to an I frame), the next decodable frame comprising a next intra frame (e.g., I frame) (see col. 8, lines 36-51).

As to claim 54, Mao disclose the system as recited in claim 52, wherein the processor-executable instructions (e.g., element management system 13 which is software based) are adapted to cause the system to perform a further action comprising:

buffering (e.g., buffer 50 stores minimum fifteen frames for each channel) a video stream portion of a video stream, which is associated with the requested channel, to a length that at least equals a sum of a multicast joining time and an intra frame interval duration (see col. 8, lines 36-42);

wherein the action of synchronizing comprises an action of determining when the next decodable frame is entering the multicast joining time part of the buffered video stream portion of the video stream (e.g., processor 55 always pointing to an I frame), the next decodable frame comprising a next non-intra frame (see col. 8, lines 27-51).

As to claim 55, Mao discloses the system as recited in claim 52, wherein the processor-executable instructions (e.g., element management system 13 which is

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software based) are adapted to cause the system to perform a further action

comprising:

issuing a join command (e.g., confirmation signal) responsive to the synchronizing (see col. 6, lines 16-29).

As to claims 2 and 3, they contain the limitations of claim 23 and are analyzed as previously discussed with respect to claim 23 above.

As to claims 4 and 5, they contain the limitations of claim 36 and are analyzed as previously discussed with respect to claim 36 above.

As to claim 6, Mao discloses the method as recited in claim 4, further comprising: buffering a video stream portion (e.g., buffer 50 stores minimum fifteen frames for each channel), wherein the synchronizing comprises determining when the retained intra frame reaches a joining time (e.g., transmitting time) of the buffered video stream portion (e.g., processor 55 always pointing an I frame on buffer 50) (see col. 8, lines 36-51).

As to claim 7, it contains the limitations of claim 37 and is analyzed as previously discussed with respect to claim 37 above.

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As to claim 9, Mao discloses the method as recited in claim 7, wherein the issuing comprises: transmitting a join message to a replication point (e.g., sending a confirmation signal to BNU 14) (see col. 6, lines 16-29).

As to claim 10, it contains the limitations of claims 2-5 and 7 and is analyzed as previously discussed with respect to claims 2-5 and 7 above.

As to claim 12, Mao discloses One or more processor-accessible media comprising processor-executable instructions that (e.g., element management system 13 which is software based), when executed, direct an apparatus to perform the method as recited in claim 1 (see col. 3, lines 34-41).

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 8, 16, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mao in view of Jerding et al. (Pub # US 2005/0240961 A1).

As to claim 26, Mao discloses the channel change server as recited in claim 23, further comprising:

a join command issuer (e.g., BDT 12) that is adapted to send a join instruction message (e.g., confirmation signal) to the particular client, the join instruction message stipulating (see col. 9, lines 9-25).

Mao fails to disclose client transmit a join message to a replication point.

Jerding discloses an appointed time (e.g., after respond message 133 is received) at which the particular client is to transmit a join message (e.g., message 133; Fig. 4I) to a replication point (see paragraph 0066).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a client respond message as taught by Jerding to the channel change system of Mao because the program can suspend the provision of the motion video presentation responsive to a first user input and provide a promotional motion video presentation to the user responsive to the first user input (see paragraph 0010).

As to claims 8 and 16, they contain the limitations of claim 26 and are analyzed as previously discussed with respect to claim 26 above.

10. Claims 11, 21-22, and 33-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mao.

As to claim 33, Mao discloses the channel change server as recited in claim 29, wherein the synchronization determiner (e.g., processor 55) is further adapted to determine that a join command (e.g., confirmation signal) is to be issued, a joining time (e.g., transmitting time; i.e., signal transmitting time between user and BDT) of the time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) of the video stream that is associated with the requested channel (see col. 7, lines 39-57; col. 8, lines 36-51).

Mao does not specifically disclose when to issue the join command.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose any time as the send command time after the channel change request received in order to minimize the waiting time for synchronize frame.

As to claim 21, it contains the limitations of claim 33 and is analyzed as previously discussed with respect to claim 33 above.

As to claim 34, Mao discloses the channel change server as recited in claim 29, wherein the synchronization determiner (e.g., processor 55) is further adapted to prompt issuance of a join command (e.g., confirmation signal), time-delayed buffered portion (e.g., FIFO buffer 50 stores minimum 15 frames for each channel) of the video stream that is associated with the requested channel even if the extracted retained intra frame of the video stream associated with the requested channel has not been fully delivered to the particular client using the unicast communication (e.g., the confirmation signal

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does not depending on the I frame transition) (see col. 6, lines 16-29; col. 7, lines 39-57; col. 8, lines 36-51).

Mao does not specifically disclose when to issue the join command.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to choose any time as the send command time after the channel change request received in order to minimize the waiting time for synchronize frame.

As to claim 22, it contains the limitations of claim 34 and is analyzed as previously discussed with respect to claim 34 above.

As to claim 11, Mao discloses the method as recited in claim 1, further comprising:

buffering a video stream portion (e.g., buffer 50 stores minimum fifteen frames for each channel) (see col. 8, lines 36-42);

retrieving, responsive to the detecting, the retained intra frame for the requested channel from the buffered intra frames with regard to a joining time of the buffered video stream portion (e.g., processor 55 access FIFO buffer 50 for stored I frame) (see col. 8, lines 42-51);

synchronizing a multicast joining operation to the multicast group corresponding to the requested channel based, at least partially, on whether a next decodable frame is outside the joining time (e.g., processor 55 keeps track of I frame from each channel) (see col. 9, lines 9-25);

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issuing a join command (e.g., confirmation signal) responsive to the synchronizing (see col. 6, lines 16-30).

Mao does not specifically disclose buffer at least two intra frames for each channel.

Mao discloses buffer minimum one GOP (i.e., one I frame in each GOP) frame for each channel.

It would be obvious that a program developer can chose any buffer size (e.g., two GOP frames) for buffering video data base on the design requirement.

11. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mao in view of Duso et al. (Patent # US 5892915).

As to claim 46, Mao discloses the server as recited in claim 41, wherein the server is capable of synchronizing a multicast joining operation for the requesting client with regard to a next decodable frame of the requested video channel (see col. 9, lines 9-25);

Mao fails to disclose stop transmitting I frames when detects the transmission failure.

Duso discloses the server is further adapted to refrain (e.g., freeze frame) from transmitting the retained at least one independent frame of the requested video channel to the requesting client if transmission of the retained at least one independent frame

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jeopardizes timely reception (e.g., failover is occurring) of the next decodable frame of the requested video channel (see col. 54, lines 36-52).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a failure detection as taught by Duso to the channel change system of Mao because it will ensure continuity of transmission of the video stream of each clip (see col. 3, lines 3-13).

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lin et al. (Patent # US 6,738,980 B2) is cited to video streaming.

Cooper (Pub # US 2004/0003399 A1) is cited to teach channel surfing.

Baldwin (Pub # US 2004/0255328 A1) is cited to teach fast start up for video streaming.

Cooper (Pub # US 2004/0003399 A1) is cited to teach channel surfing.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jun Fei Zhong whose telephone number is 571-270-1708. The examiner can normally be reached on Mon-Fri, 7:30-5:00 EST.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivek Srivastava can be reached on 571-272-7304. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JFZ
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VIVEK SRIVASTAVA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600